

AUG 05 2010

Applicants have amended Claims 1 in a good faith effort to eliminate language from Claim 1 which is does not accurately claim the invention.

Applicants have eliminated the line in Claim 1 that states that the solvent is different from the additive.

Claim 1 claims "an electrically conductive conjugated polymer" and "a precursor to an electrically conductive conjugated polymer." The Examiner asserts in the Office Action that the doping process is not directed to the electrically conductive conjugated polymer, so that the "partial limitation is confusing and indefinite."

The first sentence found in the specification at page 9 states: "The present invention is directed toward *electrically conducting polymer precursors and (electrically) conducting polymers*." This statement, along with others throughout the specification unequivocally explicates that there are two separate types of polymers which are embodiments of the invention.

One category of polymers covered in the invention is "an electrically conductive conjugated polymer." "Conductive polymers" are more precisely defined as "intrinsically conducting polymers" and, as the expression implies, are organic polymers that conduct electricity. See: György Inzelt (2008), *Conducting Polymers A New Era in Electrochemistry*. Springer. pp. 265-269. Conjugated polymers are unique in that they are conducting polymers because they have backbones of contiguous  $sp^2$  hybridized carbon centers.

The first aforementioned category of polymers defined in the claims of the present invention contains polymers having a structure *per se* suitable for conducting electricity. The language in Claim 1 defining the first category of polymers embodies an electrically conductive conjugated polymer, either "neat" or one that has been "doped." Either way, it is an "electrically conductive conjugated polymer."

As disclosed in the specification, conductive polymers are "doped" by adding chemical reactants to oxidize, or sometimes reduce, the system so that electrons are pushed into the conducting orbitals within the already potentially conducting polymer system.

There are various methods of doping a conductive polymer, both of which use an oxidation-reduction (i.e., redox) process exposing a polymer such as polyaniline or others listed in the specification to an oxidant or to a reductant.

Polymer electrical conductivity results from the doping process of partial oxidation or reduction. Polyaniline and other polymer compounds disclosed in the specification are presently designed commercially now to achieve the required conductivity for a given application.

Thus the second category of polymers defined in the claims of the present invention contains polymers having a molecular structure suitable for doping to conduct electricity. A doped electrically conductive polymer results.

The mechanical properties and electrical conductivity properties are fine-tuned using diverse methods of organic synthesis. The result is that some commercial applications are able to utilize an electrically conductive conjugated polymer without doping; and some commercial applications must utilize an electrically conductive conjugated polymer precursor which is then doped. The necessary extent and degree of conductivity of the polymer and the application to which it is put, serves to control whether the polymer can be used neat or whether the polymer must be doped.

For the reasons stated above, the doping process is only directed to the precursor polymer because the electrically conductive conjugated polymer in and of itself conducts electricity and the final state of the polymer controls the interpretation of the claim language since it does not matter whether the polymer is doped or not—it is electrically conductive.

Likewise, the “precursor” to an electrically conductive conjugated polymer is exactly what the word says. The term “precursor” is used in Claim 1 consistent with any standard dictionary meaning of same, to wit: “1. a person or thing that precedes and shows or announces someone or something to come; harbinger; 2. a predecessor or forerunner; 3. (Chemistry) a chemical substance that gives rise to another more important substance.”

The expression “precursor to an electrically conductive conjugated polymer” defines the conjugated polymers listed in Claim 1 (and Claim 57) that are subjected to a doping reaction. Said precursor polymer may have no conductivity or not sufficient conductivity for the application to which the polymer is being put. In either conductivity situation, it is doped to subsequently become an electrically conductive conjugated polymer. In summary, all of the conjugated polymers are electrically conductive, it is just that some, at the outset, are more conductive than others, which is determinative of whether they are doped for future beneficial use.

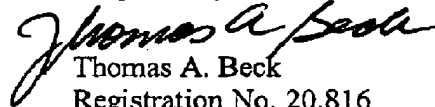
The polymer “polythianaphthene” has been added to Claim 1. Support is found in Claim 9 as originally filed. Claim 20 has been amended pursuant to the Examiner’s suggestion. Claim 22 has been canceled.

In the Office Action, the Examiner commented that the recited polymers in lines 11 – 13 and lines 15 – 17 are exactly the same. Applicants are adding Claim 57 to cure that objection, even though, in view of the arguments submitted above on that matter, Claim 1 is allowable. Applicants’ attorney declares that new Claim 57 has wording identical with Claim 1 except for the deletion of certain polymers from each category of polymers recited in lines 11 – 13 and lines 15 – 17 therein. No additional search is warranted or required.

Applicants respectfully submit that the amendment to Claim 1 defining certain elements with greater specificity, and the cancellation of Claim 22 and other amendments to the claims dependent thereon remove the rejections cited by the Examiner pursuant to 35 U.S.C. §112, second paragraph.

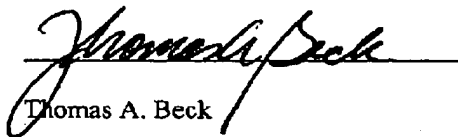
In view of the arguments and modifications to the claims, allowance of this case is warranted. If the Examiner wishes to discuss via telephone the substance of any of the proposed claim changes contained herein with the intent of putting them into an allowable form, Applicants' attorney will be glad to speak with him at a mutually agreeable time and will cooperate in any way possible.

Respectfully submitted,



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I hereby certify that this amendment response is being telefaxed to (571) 273-8300 on the date indicated below addressed to Commissioner of Patents & Trademarks, Post Office Box 1450, Alexandria, VA 22313-1450.

  
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